CLAIMS:

1.   An apparatus (365) in a digital video transmitter (110) for digitally encoding video signals within an overcomplete wavelet video coder (210), said apparatus (365) comprising a video coding algorithm unit (365) that is capable of using location information of significant wavelet coefficients in a first video frame and motion information to temporally predict location information of significant wavelet coefficients in a second video frame.

2.   An apparatus (365) as claimed in Claim 1 wherein said motion information comprises a motion vector between said first video frame and said second video frame.

3.   An apparatus (365) as claimed in Claim 1 wherein said video coding algorithm unit (365) is further capable of receiving spatial prediction information from a spatial parent of said second frame and predicting location information of significant wavelet coefficients in said second video frame using one of: spatial prediction information from said spatial parent and temporal prediction information derived using said motion information.

4.   An apparatus (365) as claimed in Claim 3 wherein said video coding algorithm unit (365) identifies location information of significant wavelet coefficients in said second video frame when said temporal prediction information predicts a location for said significant wavelet coefficients in said second video frame and/or when said spatial prediction information predicts a location for said significant wavelet coefficients in said second video frame.

5.   An apparatus (365) as claimed in Claim 3 wherein said video coding algorithm unit (365) is capable of receiving temporal prediction information from a plurality of temporal parents of said second video frame and identifying location information of significant wavelet coefficients in said second video frame when a majority of said plurality of said temporal parents predict a location for said significant wavelet coefficients in said second video frame.

6.   An apparatus (365) as claimed in Claim 3 wherein said video coding algorithm unit (365) is further capable of receiving location information of significant wavelet coefficients from each of a plurality of video frames and motion information for each of said plurality of video frames and using said location information and said motion information to temporally predict location information of significant wavelet coefficients in said second video frame.

7.   An apparatus (365) as claimed in Claim 6 wherein a first portion of said plurality of video frames occur before said second video frame and a second portion of said plurality of video frames occur after said second video frame.

8.   An apparatus (365) as claimed in Claim 6 wherein said video coding algorithm unit (365) is further capable of creating at least one residue subband by filtering at least one spatio-temporally filtered video frame through a high pass filter.

9.   An apparatus (365) as claimed in Claim 1 wherein said video coding algorithm unit (365) is further capable of establishing an order for encoding clusters of significant wavelet coefficients using a cost factor C for each cluster where C is expressed as:

$$C = R + \lambda D$$

where R represents a number of bits needed to code a cluster and D represents a distortion reduction D that is obtained by coding the cluster and lambda (λ) represents a Lagrange multiplier.

10.   A method for digitally encoding video signals within an overcomplete wavelet video coder (210) in a digital video transmitter (110), said method comprising the steps of:

locating significant wavelet coefficients in a first video frame; and

temporally predicting location information of significant wavelet coefficients in a second video frame using location information of said significant wavelet coefficients in said first video frame and motion information.

11.   A method as claimed in Claim 10 wherein said motion information comprises a motion vector between said first video frame and said second video frame.

12.   A method as claimed in Claim 10 further comprising the steps of:

obtaining spatial prediction information from a spatial parent of said second frame; and

predicting location of significant wavelet coefficients in said second video frame using one of: spatial prediction information from said spatial parent and temporal prediction information derived using said motion information.

13.   A method as claimed in Claim 12 further comprising the steps of:

determining that said temporal prediction information predicts a location for said significant wavelet coefficients in said second video frame and/or determining that said spatial prediction information predicts a location for said significant wavelet coefficients in said second video frame; and

identifying location information of significant wavelet coefficients in said second video frame.

14.   A method as claimed in Claim 12 further comprising the steps of:

obtaining temporal prediction information from a plurality of temporal parents of said second video frame;

determining that a majority of said plurality of said temporal parents predict a location for said significant wavelet coefficients in said second video frame; and

identifying location information of significant wavelet coefficients in said second video frame based on said prediction of said majority of said temporal parents of said second video frame.

15.   A method as claimed in Claim 12 further comprising the steps of:

obtaining location information of significant wavelet coefficients from each of a plurality of video frames;

obtaining motion information for each of said plurality of video frames; and

temporally predicting location information of significant wavelet coefficients in said second video frame using said location information and said motion information.

16.   A method as claimed in Claim 15 wherein a first portion of said plurality of video frames occur before said second video frame and a second portion of said plurality of video frames occur after said second video frame.

17.   A method as claimed in Claim 15 further comprising the step of:

creating at least one residue subband by filtering at least one spatio-temporally filtered video frame through a high pass filter.

18.   A method as claimed in Claim 10 further comprising the step of:

establishing an order for encoding clusters of significant wavelet coefficients using a cost factor C for each cluster where C is expressed as:

$$C = R + \lambda D$$

where R represents a number of bits needed to code a cluster and D represents a distortion reduction D that is obtained by coding the cluster and lambda (λ) represents a Lagrange multiplier.

19.   A digitally encoded video signal generated by a method for digitally encoding video signals within an overcomplete wavelet video coder (210) in a digital video transmitter (110), said method comprising the steps of:

locating significant wavelet coefficients in a first video frame; and

temporally predicting location information of significant wavelet coefficients in a second video frame using location information of said significant wavelet coefficients in said first video frame and motion information.

20. A digitally encoded video signal as claimed in Claim 19 wherein said motion information comprises a motion vector between said first video frame and said second video frame.

21. A digitally encoded video signal as claimed in Claim 19 wherein said method further comprises the steps of:

obtaining spatial prediction information from a spatial parent of said second frame; and

predicting location of significant wavelet coefficients in said second video frame using one of: spatial prediction information from said spatial parent and temporal prediction information derived using said motion information.

22. A digitally encoded video signal as claimed in Claim 21 wherein said method further comprises the steps of:

determining that said temporal prediction information predicts a location for said significant wavelet coefficients in said second video frame and/or determining that said spatial prediction information predicts a location for said significant wavelet coefficients in said second video frame; and

identifying location information of significant wavelet coefficients in said second video frame.

23. A digitally encoded video signal as claimed in Claim 21 wherein said method further comprises the steps of:

obtaining temporal prediction information from a plurality of temporal parents of said second video frame;

determining that a majority of said plurality of said temporal parents predict a location for said significant wavelet coefficients in said second video frame; and

identifying location information of significant wavelet coefficients in said second video frame based on said prediction of said majority of said temporal parents of said second video frame.

24.   A digitally encoded video signal as claimed as claimed in Claim 21 wherein said method further comprises the steps of:

obtaining location information of significant wavelet coefficients from each of a plurality of video frames;

obtaining motion information for each of said plurality of video frames; and

temporally predicting location information of significant wavelet coefficients in said second video frame using said location information and said motion information.

25.   A digitally encoded video signal as claimed in Claim 24 wherein a first portion of said plurality of video frames occur before said second video frame and a second portion of said plurality of video frames occur after said second video frame.

26.   A digitally encoded video signal as claimed in Claim 24 wherein said method further comprises the step of:

creating at least one residue subband by filtering at least one spatio-temporally filtered video frame through a high pass filter.

27.   A digitally encoded video signal as claimed in Claim 19 wherein said method further comprises the step of:

establishing an order for encoding clusters of significant wavelet coefficients using a cost factor C for each cluster where C is expressed as:

$$C = R + \lambda D$$

where R represents a number of bits needed to code a cluster and D represents a distortion reduction D that is obtained by coding the cluster and lambda (λ) represents a Lagrange multiplier.